

PATENT SPECIFICATION

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(54) COATING BEET SEED

(71) We, THE SOCIÉTÉ ANONYME INTEROX, of Rue du Prince Albert, 33, B-1050 Brussels, Belgium, a body corporate organised in accordance with the laws of Belgium, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a process for coating beet seed. It relates also to coated seed obtained in accordance with this process.

Individual sugar beet seeds have non-symmetrical shapes and variable dimensions which do not permit automatic precision sowing. It has therefore been suggested that beet seed should be coated with various substances for the purpose of giving the seeds suitable shapes, preferably spherical, and homogeneous dimensions. Granulation of this seed is however somewhat arduous and it is difficult to obtain grains of uniform shape and smooth appearance. Furthermore, the various types of coating employed hitherto have had the effect of reducing the germinating power of the seed.

The applicant has now found a process which does not present these disadvantages.

This invention therefore relates to a process for coating beet seed characterised in that the coating comprises calcium peroxide.

The process in accordance with the invention can be applied to all types of beet seed, including both genetic and mechanical monogerm seed. Furthermore, the process can also be applied to the seed of all types of beet and in particular to the seed of fodder and sugar beet.

The amount of calcium peroxide present in the coating agent may vary within very wide limits. It is generally speaking between 0.01 and 90% of the total weight of coating agents. In the majority of cases the coating agent contains from 0.05 to 30% calcium peroxide relative to the total weight of coating agent. Calcium peroxide contents between 0.1 and 30% of the total weight of coating agent have proved particularly advantageous.

The coating agent may also contain one or more other additives such as adhesives, agents which protect the seed against selective herbicides as well as fillers both organic and inorganic.

Generally speaking, care is taken to ensure that the additives present in the coating agent are not phytotoxic.

Adhesives or binders are used for facilitating adhesion to the seed grains of the calcium peroxide and any other additives.

As adhesives one can in particular use methylcelluloses, hydroxylated polymers such as polyvinyl alcohol, gum arabic, soluble starch and gelatine. Other adhesives may also be suitable. The adhesives content may vary within fairly wide limits depending upon the nature of the other ingredients of the coating agent. Generally speaking, the quantity used is between 0.001 and 10%, preferably between 0.01 and 1% by weight of adhesives relative to the total coating agent weight. When the coating agent contains high proportions of calcium peroxide, for example in excess of 15% by weight of the weight of coating agent, fairly high adhesive contents are preferable particularly between 0.01 and 2% by weight relative to the total weight of coating agent. When the proportions of calcium peroxide are lower, for example below 10% by weight relative to the weight of coating agent, the contents of adhesives are preferably between 0.01 and 0.5% by weight of the total weight of coating agent. Adhesives are usually used in the form of aqueous solutions at the time of coating.

The coating agent may also contain organic or mineral type fillers. It is also

possible to use mixed fillers. The fillers are fine powders possessing generally speaking a particle size such that they will pass through a 170 mesh screen or preferably through a 325 mesh screen (US standard). Natural cellulose-based substances such as powder obtained from wood are generally used as fillers of organic type. Inorganic or mineral type fillers used include mainly substances based on silica, silicates or carbonates, such as bentonite, talc, diatomaceous earths, Fuller's earths, clay and chalk. Other non phytotoxic fillers are also suitable. The content of fillers may vary between very wide limits. It generally falls between 0 and 99.99% by weight of the total weight of coating agent, preferably 25 to 99.9% by weight of the total weight of coating agent. Contents between 50 and 99% have proved advantageous.

The coating agents can also contain various other additives such as fertilisers, fungicides and insecticides, agents offering protection against selective herbicides and those used for improving the quality of the beet such as for example boron derivatives, in particular boric acid, borax and sodium perborate. These additives are generally speaking present in the proportion of 0 to 10%, preferably between 0 and 5%, by weight relative to the total weight of coating agent.

One example of a particularly suitable coating composition contains preferably:

0.05 to 50% by weight calcium peroxide
0 to 10% by weight adhesives
50 to 99.9% by weight fillers, and
0 to 5% by weight miscellaneous additives.

The proportion of coating agent relative to the seed is most frequently between 1 and 10 kg of coating agent per kg of seed. Coating agent contents between 2 and 4 kg per kg of seed are particularly suitable.

The coating operations can be carried out in any manner known in itself in various types of apparatus known in themselves, including for instance, granulators. These are fed with seed, calcium peroxide and possibly fillers, water and other additives. The resulting grains are then dried.

The particle size of the coated grains is controlled in accordance with the diameters of the seeders. Diameters between 2 and 3 mm are particularly suitable.

The invention concerns also the coated seed obtained according to the above process.

The process which constitutes the object of this invention offers many advantages. When the seed coated in accordance with the invention is used for early sowing, germination is found to be more rapid than with the normal seed. In addition, the resulting young plants offer greater resistance to the inclement weather which may prevail during the period of initial growth. Furthermore, the germinating power of the seed is equal to that of the uncoated seed whereas commercial coated seed has a lower germinating power. Finally, it is observed that the granulation process is much easier and the resulting grains have a uniform smooth surface which considerably facilitates their use.

The following example which is not of a limiting character has been given in order to illustrate the remarkable results obtained in accordance with the invention process.

Example

Three field sowings were carried out respectively with seed coated in accordance with the invention (test 1) and, by way of comparison, seed coated in accordance with known processes (test 2R) and uncoated seed (test 3R).

The coating of the seed is effected using 3 kg of coating agent per kg of seed. In the test performed in accordance with the invention, 3 kg of coating agent contain 2.8 kg of a commercial filler Fillcoat based on bentonite and 0.2 kg commercial grade calcium peroxide containing 80% calcium peroxide.

In the comparison test 2R the coating agent consists solely of the commercial filler Fillcoat and contains no calcium peroxide.

To carry out the coating, the seed, the ingredients of the coating agent, and water in the proportion of 30% by weight relative to the total coating agent weight are introduced into the granulator. The resulting grains are dried for 9 hours in order to reduce their water content to 5%.

The diameter of the resulting grains is between 2.5 and 2.7 mm.

The germination rates obtained with the three types of seeds are given in Table I below.

TABLE I

		Proportion of seeds having germinated	
5	Test 1 Seed coated with coating agent containing CaO_2	83%	5
10	Test 2R Seed coated with coating agent without CaO_2	80%	10
	Test 3R Uncoated seed	83%	

An examination of Table I shows that the coating in accordance with the invention permits a germination rate to be obtained that is identical to that obtained with uncoated seed whereas the conventional coatings (test 2R) give a lower rate of germination.

WHAT WE CLAIM IS: *sub same*

1. A process for coating beet seed which comprises coating the seed with a coating agent comprising calcium peroxide.
2. A process as claimed in claim 1, wherein the coating agent contains 0.01 to 90% by weight of calcium peroxide.
3. A process as claimed in claim 2, wherein the coating agent contains 0.05 to 50% by weight of calcium peroxide.
4. A process as claimed in any one of claims 1 to 3, wherein the coating agent contains at least one organic filler, at least one inorganic filler, and/or at least one adhesive.
5. A process as claimed in claim 4, wherein the coating agent contains at least one filler.
6. A process as claimed in claim 5, wherein the coating agent contains between 25 and 99.9% by weight of filler.
7. A process as claimed in either of claims 5 and 6, wherein the filler is inorganic.
8. A process as claimed in claim 7, wherein the inorganic filler is silica, a silicate, or a carbonate.
9. A process as claimed in claim 8, wherein the inorganic filler is bentonite, talc, a diatomaceous earth, a Fuller's earth, clay, or chalk.
10. A process as claimed in either of claims 5 and 6, wherein the filler is organic.
11. A process as claimed in claim 10, wherein the organic filler is a natural product based on cellulose.
12. A process as claimed in claim 11, wherein the organic filler is powder obtained from wood.
13. A process as claimed in claim 4, wherein the coating agent contains at least one adhesive.
14. A process as claimed in claim 13, wherein the adhesive is a methylcellulose, a hydroxylated polymer, gum arabic, soluble starch, or gelatine.
15. A process as claimed in either of claims 13 and 14, wherein the coating agent contains 0.001 to 10% by weight of adhesive.
16. A process as claimed in claim 15, wherein the coating agent contains 0.01 to 1% by weight of adhesive.
17. A process as claimed in any one of claims 1 to 16, characterised in that the coating agent contains:
 - 0.05 to 50% by weight calcium peroxide;
 - 0 to 10% by weight adhesives;
 - 50 to 99.9% by weight filler; and
 - 0 to 5% by weight miscellaneous additives.
18. A process as claimed in any one of claims 1 to 17, wherein the beet seed is a genetic monogerm seed.
19. A process as claimed in any one of claims 1 to 17, wherein the beet seed is a mechanical monogerm seed.
20. A process as claimed in any one of claims 1 to 19 wherein the beet seed is a sugar beet seed.

21. A process as claimed in any one of claims 1 to 19, wherein the beet seed is a fodder beet seed.
22. A process as claimed in claim 1, performed substantially as hereinbefore described.
- 5 23. A process for coating a beet seed, performed substantially as described in Example 1 herein with reference to Test 1. 5
24. Beet seed which has been coated by a process as claimed in any one of claims 1 to 23.
- 10 25. Beet seed as claimed in claim 24, which has a mean diameter of from 2 to 3 mm including the coating. 10
26. Beet which has been grown from beet seed as claimed in claim 25.
27. Coated beet seed having thereon a coating comprising calcium peroxide, wherein the coating has a feature of composition specified for the coating agent in any one of claims 2 to 17 or the features of composition specified for the coating agent in any two or more of claims 2 to 17. 15
- 15 28. Coated beet seed as claimed in claim 27 wherein the beet seed is a genetic monogerm seed. 15
29. Coated beet seed as claimed in claim 27, wherein the beet seed is a mechanical monogerm seed.
- 20 30. Coated beet seed as claimed in any one of claims 27 to 29, wherein the beet seed is sugar beet seed. 20
31. Coated beet seed as claimed in any one of claims 27 to 29, wherein the beet seed is a fodder beet seed.
- 25 32. Coated beet seed as claimed in any one of claims 27 to 31, which has a mean diameter of from 2 to 3 mm. 25
33. Beet which has been grown from beet seed as claimed in any one of claims 27 to 32.
34. A process as claimed in claim 1 characterised in that the seed is coated with a coating agent containing calcium peroxide.

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